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IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
BEFORE THE BOARD OF APPEALS AND INTERFERENCES

In Re Application of:	Shunpei Yamazaki
Serial No.:	09/724,002
Filed:	November 28, 2000
For:	Film Deposition Apparatus And Method Of Manufacturing A Light Emitting Device Using The Apparatus
Examiner:	Karla A. Moore
Art Unit:	1763

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Cathy Andres

Date: April 1, 2005

APPELLANTS' BRIEF UNDER 37 C.F.R. 1.192

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April 1, 2005

TABLE OF CONTENTS

TABLE OF AUTHORITIES

APPELLANT'S BRIEF UNDER 37 C.F.R. §1.192

This Brief is in furtherance of the Notice of Appeal filed in this Application Serial No. 09/724,002 on February 1, 2005.

This appeal is in response to the Final rejection of October 1, 2004 rejecting all the pending claims.

The claims of the present application are clearly patentable over the cited references, as will be shown *infra*, and Appellants respectfully request the Board to so rule and allow the application.

I. STATEMENT OF REAL PARTY IN INTEREST

The real party in interest in this appeal is the assignee: Semiconductor Energy Laboratory Co., Ltd., 398, Hase, Atsugi-shi, Kanagawa-ken 243-0036 Japan.

II. STATEMENT OF RELATED APPEALS AND INTERFERENCES

To the best of Appellants' and Appellants' legal representatives' knowledge, there are no appeals or interferences pending which will affect or be affected by the Board's decision in this appeal.

III. STATUS OF CLAIMS

Claims 1-18 and 32-52 are pending and rejected. Claims 19-30 are canceled. Claims 1-18 and 31-52 are the appealed claims and appear in Section IX, *infra* at p. 16 *et seq.*

IV. STATUS OF AMENDMENTS

An Amendment After Final (Amendment E) is being filed herewith on April 1, 2005 to correct a minor misspelling in Claim 1. This amendment has not yet been entered.

V. SUMMARY OF INVENTION

The present invention as recited in independent Claims 1, 4, 7, 10, 13 and 16 and those claims dependent thereon concerns a novel film deposition apparatus.

The present invention relates to a thin film deposition apparatus for manufacturing an EL (Electro Luminescence) element generally composed of an anode, a cathode, and an EL-providing luminescent material, especially a luminescent organic material (hereinafter referred to as organic EL material), sandwiched therebetween.

The specification and drawings of the present application provides support and explanation for the features of independent Claims 1, 4, 7, 10, 13 and 16 as described below.

More specifically, for independent Claim 1, the features of this claim are shown in the specification and drawings, for example, as follows:

A film deposition apparatus (page 3, lns. 6-8, Figs. 1, 2) comprising:

a stock chamber (105, Fig. 1) for loading or unloading a substrata (page 6, ln. 12 - page 7, ln. 1);

a transferring chamber (106, Fig. 1) including a mechanism (107, Fig. 1) for transferring said substrate (page 7, lns. 2-12); and

a liquid phase film deposition chamber (109, Figs. 1, 2A, 2B) connected to said transferring chamber (106) through a gate (100d) (page 7, lns. 13-20; page 8, ln. 2 -

page 9, ln. 2),

wherein said liquid phase film deposition chamber is provided with a mechanism for oxidizing (205, Figs. 2A, 2B) an element belonging to Group 1 or 2 of the periodic table (i.e. The Periodic Table of The Elements) (page 3, ln. 9 - page 4, ln. 16; page 8, ln. 12 - page 9, ln. 2).

Independent Claim 4 includes the features of Claim 1 but has a different liquid deposition chamber (301, as shown in Figs. 3A-3C; see page 13 et seq.). Claim 4 recites:

...wherein said liquid phase film deposition chamber (301) is provided with, via a piping (303), a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table (page 13, ln. 18 - page 14, ln. 22).

Independent Claim 7 includes the features of Claim 1 but also recites:

...two transferring chambers (101, 106) each connected to said stock chamber through a gate (100a, 100b, respectively; page 5, ln. 15 - page 7, ln. 12);

a vapor phase film deposition chamber (109) connected to one of said two transferring chambers (106) through a gate (100d).

Independent Claim 10 includes the features of the two transferring chambers of Claim 7 and the piping of Claim 4 and the support for this claim is as explained above for Claims 4 and 7.

Independent Claim 13 includes the features of Claim 1 (see Claim 1 above for support), but the liquid phase film deposition chamber is specifically recited to be an EL material deposition chamber (see page 7, lns. 14-16).

Independent Claim 16 includes the features of Claim 7 (see Claim 7 above for support), but the liquid phase film deposition chamber is specifically recited to be an EL material deposition chamber (see page 7, lns. 14-16).

The dependent claims are based, either directly or indirectly, on each of the above-identified independent claims, and accordingly, all the elements listed above for the independent claims, and the support for these elements in the specification and drawings are as mentioned *supra*. These dependent claims also add additional elements or limitations which are supported in the specification and drawings.

For example, Claims 2, 5, 8, 11 and 14 are dependent claims which further recite that an inside of the transferring chamber is kept under a reduced pressure and the film deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state (page 9, lns. 19-23).

Claims 47-52 are dependent claims which further recite that the mechanism or cell for oxidizing an element belonging to Group 1 or 2 of the periodic table is provided with a lid (page 9, lns. 3-4 and 12-13).

As the other dependent claims are not argued separately, these features are not discussed herein.

VI. ISSUES

1. Whether independent Claims 1 and 13 are unpatentable under 35 USC §103(a) over Hiraga et al. in view of Harrah et al.

2. Whether independent Claim 4 is unpatentable under 35 USC §103(a) over Hiraga et al. in view of Harrah et al. in view of Conte.

3. Whether independent Claims 7 and 16 are unpatentable under 35 USC §103(a) over Hiraga et al. in view of Harrah et al. and in view of Begin et al.

4. Whether independent Claim 10 is unpatentable under 35 USC §103(a) over Hiraga et al. in view of Harrah et al., in view of Begin et al. and in view of Conte.

5. Whether dependent Claims 2, 5, 8, 11, 14 and 17 are unpatentable under 35 USC §103(a) over the cited references.

6. Whether dependent Claims 47-52 are unpatentable under 35 USC §103(a) over the cited references.

VII. GROUPING OF CLAIMS

It is submitted that the claims do not stand or fall together but are separately patentable. Each of the independent claims is discussed herein and is directed to a different aspect of the present invention or a specific level of detail thereof. They are separately argued. Dependent Claims 2, 5, 8, 11, 14 and 17 and Claims 47-52 also separately argued and do not stand or fall with the other claims.

Further reasons for the separate patentability of the claims are included within the Argument (see Section VIII, *infra*).

VIII. ARGUMENT

A. BACKGROUND

The present invention is directed to a novel thin film apparatus for manufacturing an EL display device containing an EL-providing luminescent material, especially an organic EL material.

Organic materials are divided into low molecular type (monomer based) organic EL materials and high molecular type (polymer based) organic EL materials. As the polymer based EL organic materials are easier to handle and more resistive against heat than the low molecular type organic EL materials, there is currently a great deal of interest in the use of such polymer based EL organic materials for display devices.

Organic EL materials, however, readily change their molecular structure through oxidization, losing their ability to emit light. Hence, if a light emitting layer formed from an organic EL material is oxidized, the oxidation will deprive an EL element of its ability to emit light and will degrade the EL element. It is thus important in order to manufacture a highly reliable EL element to remove oxygen (O_2), which accelerates oxidization of the organic EL material, as soon as possible after the organic EL material has been formed.

In general, low molecular type organic materials have no significant problem with oxygen being mixed in an EL element, as the low molecular organic EL materials are deposited in vacuum by evaporation. Because the EL element is not exposed to the air and is sealed in an air-tight space after the monomer based organic EL material has been deposited, the EL element can be completed without exposing the EL element to the air, during the deposition step.

It is difficult, however, to form a film from the high molecular type organic EL material in vacuum and, hence, deposition of the polymer based organic EL material is often carried out in an inert gas atmosphere such as nitrogen or rare gas by the ink jet method, spin coating or printing. The high molecular type organic EL materials, however, are weak especially against oxygen and are readily oxidized and degraded in the presence of even a meager amount of oxygen. The degradation

may be contained to a degree that raises no significant problem by reducing the oxygen concentration in the inert gas to 1 ppm or less. However, this is still insufficient to ensure a long term reliability.

While other apparatus and methods have been devised for producing EL display devices and addressing the oxidization problem for organic EL materials, Applicants have conceived of a unique apparatus, aspects of which are recited in the claims of the present application, for addressing this problem and enhancing the reliability of the resulting light emitting device that uses a luminescent material. The apparatus of the present invention is also advantageous as it can be used with both low molecular type organic EL materials and high molecular type organic EL materials. Accordingly, the claims of the present application are not limited to either type of materials.

Applicants will now address the rejections of the claims in the Final Rejection of October 1, 2004.

B. THE REJECTIONS OF THE CLAIMS SHOULD BE REVERSED

In the Final Rejection, the Examiner rejected the claims as obvious under 35 USC §103, but as shown below, the Examiner has failed to make a prima facie case of obviousness. Instead, each rejection uses hindsight reconstruction to improperly combine references to arrive at the claimed inventions. As a result, the rejections are erroneous and should be reversed.[1]

[1] In this brief, Applicants address each of the rejections of the independent claims, these rejections apply equally to the dependent claims which are also patentable over the cited references.

C. INDEPENDENT CLAIMS 1 AND 13 WOULD NOT HAVE BEEN OBVIOUS IN VIEW OF HIRAGA ET AL. IN VIEW OF HARRAH ET AL.

In the Final Rejection, the Examiner rejected independent Claims 1 and 13 under 35 USC § 103(a) as being unpatentable over U.S. Patent No. 6,319,321 (Hiraga et al., hereinafter Hiraga) in view of U.S. Patent No. 4,405,487 (Harrah et al., hereinafter Harrah). As explained *infra*, this rejection is improper and should be reversed.

1. Under The Law, The PTO Is Required To Establish A Prima Facie Case Of Obviousness

Under 35 U.S.C. §103, the burden is on the PTO to produce evidence that the claimed invention is prima facie obvious. In re Rijckaert, 9 F.3d 1531, 1532, 28 USPQ2d 1955, 1956 (Fed. Cir. 1993); In re Fine, 837 F.2d 1071, 1074, 5 USPQ2d 1596, 1598 (Fed. Cir. 1988). If the PTO fails to make out a prima facie case of obviousness, then the rejection is improper, should be overturned, and Applicants are entitled to a patent. Rijckaert, 9 F.3d at 1532, 28 USPQ2d at 1956; In re Nielson, 816 F.2d 1567, 1572, 2 USPQ2d 1525, 1528 (Fed. Cir. 1984); In re Gordon, 733 F.2d 900, 902, 221 USPQ 1125, 1127 (Fed. Cir. 1984). A *prima facie* of obviousness cannot be based on a combination of references wherein the combinations of references is based on hindsight reconstruction using the claimed invention as a template. In re Fritch, 972 F.2d 1260, 1266 23 USPQ2d 1780, 1784 (Fed. Cir. 1992); In re Oetiker, 24 USPQ2d 1443, 1444-1446 (Fed. Cir. 1992).

2. **The Examiner Has Failed To Make A Prima Facie Case Of Obviousness As The Rejection of Independent Claims 1 and 13 Is Based On Hindsight Reconstruction**

In the Final Rejection, the Examiner states that Hiraga discloses a film deposition apparatus substantially as claimed in Figures 1-4 but admits that the liquid phase film deposition chamber of Hiraga is not provided with a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table, as required in the claims of the present application. The Examiner then cites Harrah as allegedly teaching the use of a moisture getter comprising a readily oxidizable metal in a closed container for the purposes of scavenging moisture. The Examiner then argues that "it would have been obvious to one of ordinary skill in the art at the time of the Applicant's invention was made to have provided a mechanism for oxidizing an element belonging to Group 1 or Group 2 of the periodic table in Hiraga et al. in order to scavenge moisture within chamber as taught by Harrah et al." (10-1-04 Final Rejection p. 2-3) Applicants disagree.

In particular, Hiraga discloses a film deposition apparatus comprising: a vacuum vessel (1) used as an entry air lock for the substrate; and a transport vessel (200) to which vacuum vessels (1-7) are attached via airtight doors (11). Hiraga states that:

> "...the present invention relates to a new thin-film fabrication method and thin-film fabrication apparatus that enables high quality, high-efficiency production of high-function optical effect films that are particularly useful for wavelength-selectable transmitting films..." Col. 1, lns. 6-12.
>
> "An object of the present invention is to overcome the above-described drawbacks of the prior art by providing a thin-film fabrication method and apparatus that enables more efficient fabrication of thin films that offer high durability, high adhesion to the substrate and a high level of control of microstructures without giving rise to heat-decomposition of the thin-film composition materials." Col. 2,

lns. 40-46.

"The thin-film fabrication method of the present invention also includes a cleaning step in which the substrate surface is cleaned in *a clean, sealed vessel having neither floating particles nor contaminant gases,* the sealed vessel being provided within the vacuum vessel via an airtight door, the cleaning step being effected prior to the spray step. In this method, the spray step is effected *without exposing the substrate surface to either floating particles or contaminant gases."* Col. 3, lns. 15-23 (emphasis added).

"In accordance with this invention, before thin-film composition material in liquid form is sprayed onto the substrate, the *substrate surface is cleaned in a sealed vessel free of floating particles and/or contaminant gases* that is located inside the vacuum vessel or connected to the vacuum vessel via an airtight door, ensuring that the material can be sprayed onto a substrate surface *not exposed to floating particles and/or contaminant gases,* and thereby improving the strength of the adhesion between the formed thin film and the substrate.

"Moreover, since in accordance with the present invention the fabricated thin film *can be sealed without removal into the atmosphere, in a clean, sealed vessel having no floating particles and/or contaminant gases,* the sealed vessel being provided within the vacuum vessel or connected with the vacuum vessel via an airtight door, the thin film is *completely uncontaminated,* and therefore has improved durability." Col. 5, lns. 7-24. (emphasis added)

"Pretreatment comprising cleaning of the surface of the substrate *in a clean, sealed vessel free of dust and/or contaminating gases* in accordance with the thin-film fabrication method of this invention may be effected by a known method. In the case of optical glass, for example, organic contaminants adhering to the surface may be oxidized by a dichromic acid solution of sulfuric acid, then removed, the substrate washed in ultrapure water, then washed in ethanol, and the surface dried by vaporizing the ethanol." Col. 11, lns. 21-29. (emphasis added)

"It is possible to form thin films under such low-dust-particle count conditions by using a film fabrication apparatus provided in a clean room or clean bench. However, it is necessary to use the clean, sealed vessel such as in the thin-film fabrication

> method of this invention in order to *completely remove contaminant* gases. "Contaminant gases" include oxygen molecules, water vapor, sulfur dioxide, nitrogen oxides, ethylene gas and terpenes given off by trees, ethanol vapor, acetoaldehyde vapor, acetic acid vapor, and aroma products and the like used in cosmetics and everyday miscellaneous goods." Col. 13, lns. 47-56. (emphasis added)

Finally, Hiraga states

> "As described in the foregoing, the thin-film fabrication method and apparatus of the present invention enables thin films to be fabricated without being affected by contaminants, thereby enabling the efficient production of thin films having strong adhesion to the substrate and high durability." Col. 24, lns. 27-32.

Hence, a person of ordinary skill in the art upon reading Hiraga would understand that he only has to use a sealed vessel, as described in the reference, to completely remove contaminant gases, including oxygen and water vapor. Therefore, there is no suggestion or motivation to employ the alleged teaching of oxidizable metal in Harrah to modify the apparatus of Hiraga.

The Examiner, however, argues that "...one of ordinary skill in the art would recognize that while Hiraga provides a substantial invention-it could be improved upon, as is the case with most inventions. The disclosure of Harrah provides an example along with sufficient motivation for such an improvement". (10-1-04 Final Rejection, p. 17) Applicants again disagree.

As explained in depth in Hiraga, Hiraga has developed what is clearly stated in the reference as a complete method and apparatus which "completely" removes contaminant gases, such as oxygen molecules and water vapor through the use of a clean, sealed vessel which is located in a vacuum vessel. The Examiner however, proposes to disregard the teaching in Hiraga that oxygen and water vapor has been completely removed and wishes to add a foreign substance to the Hiraga method and apparatus to remove the water vapor (i.e. moisture) that Hiraga states has already been

removed.

It is respectfully submitted that there can be no basis for combining these references to arrive at the claimed invention other than by hindsight reconstruction, using independent Claims 1 and 13 of the present application as a blueprint.

As the Federal Circuit stated in McGinley v. Franklin Sports, Inc., 60 USPQ2d 1001, 1008, (Fed. Cir. 2001), "[t]he genius of invention is often a combination of known elements which in hindsight seems preordained." As a result, "[I]t is impermissible to use the claimed invention as an instructional manual or 'template' to piece together the teachings of the prior art so that the claimed invention is rendered obvious." In re Fritch, 972 F.2d at 1266, 23USPQ2d at 1784. Combining references in a manner that reconstructs the applicant's invention only with the benefit of hindsight, is insufficient to present a *prima facie* case of obviousness. In re Octiker, 24 USPQ2d at 1444-1446 (Fed. Cir. 1992).

Therefore, as shown above, Hiraga is a complete reference, and there is no reason for one skilled in the art reading the reference to search out a teaching of a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table, as recited in independent claims 1 and 13, other than that is a feature of the claimed invention. Further, even if one combined these references, there is no teaching or suggestion in either reference indicating that the mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table is provided in a liquid phase film deposition chamber or EL material deposition chamber, as in independent Claims 1 and 13 of the present application.

Hence, the only way the Examiner can arrive at the apparatus of Claim 1 and 13 is through

hindsight reconstruction. Further, even if the references are combined, they fail to arrive at the claimed invention. Accordingly, the combination of references and the rejection based thereon is not proper and does not disclose or suggest the claimed invention. Therefore, independent Claims 1 and 13 and those claims dependent thereon are patentable over these references, and it is respectfully requested that this rejection be reversed.

D. THE REJECTION OF INDEPENDENT CLAIM 4 IS ALSO IMPROPER

The Examiner also rejects independent Claim 4 under 35 USC §103(a) as being unpatentable over Hiraga et al. in view of Harrah et al. in view of (US 6,149,392 Conte). This rejection is also improper and should be reversed.

For substantially the same reasons discussed above in response to the rejection of Claims 1 and 13, independent Claim 4 is also patentable over Hiraga and Harrah.

Additionally, Claim 4 is directed to an alternative embodiment of the present invention having a different structure than Claims 1 and 13 wherein the liquid phase film deposition chamber is provided with, via a piping, a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table. This has a remarkable effect in that "a heat source does not need to be placed near the film deposition apparatus." See e.g. p. 14 lns. 16-20 of the present application. This makes management of the apparatus easier. Id.

It is undisputed that both Hiraga and Harrah fail to disclose or suggest this feature. The Examiner, however, cites Conte as disclosing multiple chamber and gettering configurations in

Figures 5-7, including a configuration where the getter is connected to the chamber via piping. The Examiner then concludes that it would have been obvious to provide a getter to a chamber via piping.

However, while Conte discloses a getter pump, Claim 4 recites "wherein said liquid phase film deposition chamber is provided with, via a piping, a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table." Conte does not disclose or suggest oxidizing an element belonging to Group 1 or 2 of the periodic table. Hence, Conte does not provide the necessary motivation to overcome the deficiency in the Examiner's prima facie case with regard to the other cited references. Further, since Conte does not disclose oxidizing an element belonging to Group 1 or 2 of the periodic table, there is no motivation or teaching to use this reference to arrive at the claimed invention.

Therefore, it is respectfully submitted that it would not have been obvious to a person of ordinary skill in the art at the time of the invention to modify the apparatus of Hiraga, to add the features of Harrah and Conte to arrive at the apparatus of Claim 4. Further, as explained above, even if combined (which is improper), the combination of references fails to disclose or suggest the claimed invention.

Accordingly, it is respectfully submitted that independent Claim 4 and those claims dependent thereon are patentable over these cited references, and it is requested that the rejection be reversed.

E. THE REJECTION OF INDEPENDENT CLAIMS 7 AND 16 IS ALSO IMPROPER

The Examiner also rejects independent Claims 7 and 16 under 35 USC §103 as being unpatentable over Hiraga et al. in view of Harrah et al. and in view of US 5,310,410 (Begin et al, herein after Begin).

For substantially the same reasons discussed above in response to rejection of independent Claims 1 and 13, independent Claims 7 and 16 and those claims dependent thereon are also patentable over the cited references (Begin does not cure the deficiencies discussed above for the rejection over Hiraga and Harrah), and it is requested that this rejection be reversed.

F. THE REJECTION OF INDEPENDENT CLAIM 10 IS ALSO IMPROPER

The Examiner also rejects independent Claim 10 under 35 USC §103 as being unpatentable over Hiraga et al. in view of Harrah et al., in view of Begin et al. in view of Conte.

For substantially the same reasons discussed above in response to the rejection of Independent Claim 4 (Begin does note cure the deficiencies discussed above for the rejection over Hiraga, Harrah and Conte), independent Claim 10 and those claims dependent thereon are also patentable over the cited references, and it is requested that this rejection be withdrawn.

G. DEPENDENT CLAIMS 2, 5, 8, 11, 14 AND 17 ARE ALSO PATENTABLE OVER THE CITED REFERENCES

Dependent Claims 2, 5, 8, 11, 14 and 17 are rejected over Hiraga and combinations of the other

cited references. Each of these claims recites that the deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

In contrast, Hiraga conducts film deposition in a vacuum (see e.g. col. 2, lns. 49-54; col. 4; col. 5, lns. 53-57). As explained above, the present invention as recited in dependent Claims 2, 5, 8, 11, 14 and 17 does not use a vacuum but instead uses an inert gas. Applicants have discovered this to be very advantageous, especially with the preparation of films from high molecular type organic EL material (which are very difficult to form in a vacuum). Hence, Hiraga is very different than the apparatus of dependent Claims 2, 5, 8, 11, 14 and 17.

The Examiner cites Begin as showing a multi-chamber apparatus. However, while Begin appears to disclose having chambers at different pressures, it does not disclose or suggest the feature of an inside of the transferring chamber kept under a reduced pressure and the film deposition chamber filled with an inert gas and kept under atmospheric pressure or in a pressurized state, as in dependent Claims 2, 5, 8, 11, 14 and 17.

Hence, the cited references do not disclose or suggest the apparatus of these claims. Accordingly, dependent Claims 2, 5, 8, 11, 14 and 17 are patentable over the cited references, and the rejection of these claims should be reversed.

H. DEPENDENT CLAIMS 47-52 ARE ALSO PATENTABLE OVER THE CITED REFERENCES

Dependent Claims 47-52 recite that the mechanism or cell for oxidizing an element belonging to Group 1 or 2 of the periodic table is provided with a lid. The lid is advantageous as how long the

oxygen gettering agent is to be oxidized can be adjusted by opening and closing the lid. This makes it possible to improve the manufacturing operation throughout the manufacturing procedure. It is respectfully submitted that this is a patentable distinction over the cited references. Accordingly, it is requested that the rejection of these claims be reversed.

Therefore, the claims are patentable over the cited references, and the rejection of the appealed claims should be reversed.

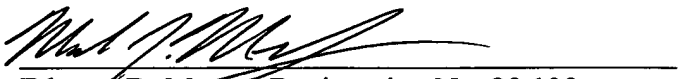
I. CONCLUSION

For at least the reasons stated above, we earnestly and respectfully submit that the rejections under 35 USC §103(a) of the claims of the present application as being unpatentable over the references cited by the Examiner in the Final Rejection are erroneous and improper.

Hence, the rejection of these claims should be reversed, and the claims allowed.

Accordingly, Appellants requests that this Appeal be sustained in all respects, and that all rejections in the Final Rejection be reversed.

Respectfully submitted,



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IX. APPENDIX

APPEALED CLAIMS (37 CFR 1.192 (C)(7))

The text of the claims on appeal is as follows:

1. A film deposition apparatus comprising:

a stock chamber for loading or unloading a substrate;

a transferring chamber including a mechanism for transferring said substrate; and

a liquid phase film deposition chamber connected to said transferring chamber through a gate,

wherein said liquid phase film deposition chamber is provided with a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table.

2. A film deposition apparatus according to claim 1, wherein an inside of said transferring chamber is kept under a reduced pressure and said liquid phase film deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

3. A film deposition apparatus according to claim 1, wherein said transferring chamber is connected to a calcining chamber through a gate, and said calcining chamber is provided with a mechanism for turning said substrate upside down.

4. A film deposition apparatus comprising:

a stock chamber for loading or unloading a substrate;

a transferring chamber including a mechanism for transferring the substrate; and

a liquid phase film deposition chamber connected to said transferring chamber through a gate,

wherein said liquid phase film deposition chamber is provided with, via a piping, a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table.

5. A film deposition apparatus according to claim 4, wherein an inside of said transferring chamber is kept under a reduced pressure and said liquid phase film deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

6. A film deposition apparatus according to claim 4, wherein said transferring chamber is connected to a calcining chamber through a gate, and said calcining chamber is provided with a mechanism for turning said substrate upside down.

7. A film deposition apparatus comprising:

a stock chamber for loading or unloading a substrate;

two transferring chambers each connected to said stock chamber through a gate;

a vapor phase film deposition chamber connected to one of said two transferring chambers through a gate; and

a liquid phase film deposition chamber connected to another said transferring chamber through a gate,

wherein said liquid phase film deposition chamber is provided with a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table.

8. A film deposition apparatus according to claim 7, wherein an inside of one of said transferring chambers is kept under a reduced pressure and said liquid phase film deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

9. A film deposition apparatus according to claim 7, wherein one of said transferring chambers is connected to a calcining chamber through a gate, and said calcining chamber is provided with a mechanism for turning said substrate upside down.

10. A film deposition apparatus comprising:

a stock chamber for loading or unloading a substrate;

two transferring chambers each connected to said stock chamber through a gate;

a vapor phase film deposition chamber connected to one of said two transferring chambers through a gate; and

a liquid phase film deposition chamber connected to another said transferring chamber through a gate,

wherein said liquid phase film deposition chamber is provided with, via a piping, a mechanism for oxidizing an element belonging to Group 1 or 2 of the periodic table.

11. A film deposition apparatus according to claim 10, wherein an inside of one of said transferring chambers is kept under a reduced pressure and said liquid phase film deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

12. A film deposition apparatus according to claim 10, wherein one of said transferring chambers is connected to a calcining chamber through a gate, and said calcining chamber is provided with a mechanism for turning said substrate upside down.

13. A film deposition apparatus comprising:

a stock chamber for loading or unloading a substrata;

a transferring chamber for transferring said substrate; and

an EL material deposition chamber connected to said transferring chamber through a gate,

wherein said EL material deposition chamber is provided with a cell which contains an element belonging to Group 1 or 2 of the periodic table.

14. A film deposition apparatus according to claim 13, wherein an inside of said transferring chamber is kept under a reduced pressure and said EL material deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

15. A film deposition apparatus according to claim 13, wherein said transferring chamber is connected to a calcining chamber through a gate, and said calcining chamber is provided with a mechanism for turning said substrate upside down.

16. A film deposition apparatus comprising:

a stock chamber for loading or unloading a substrate;

two transferring chambers each connected to said stock chamber through a gate;

a vapor phase film deposition chamber connected to one of said two transferring chambers through a gate; and

an EL material deposition chamber connected to another said transferring chamber through a gate,

wherein said EL material deposition chamber is provided with a cell which contains an element belonging to Group 1 or 2 of the periodic table.

17. A film deposition apparatus according to claim 16, wherein an inside of one of said transferring chambers is kept under a reduced pressure and said EL material deposition chamber is filled with an inert gas and is kept under atmospheric pressure or in a pressurized state.

18. A film deposition apparatus according to claim 16, wherein one of said transferring chambers is connected to a calcining chamber through a gate, and said calcining chamber is provided with a mechanism for turning said substrate upside down.

31. A film deposition apparatus according to claim 1,

wherein said liquid phase film deposition chamber is a chamber for depositing an EL material.

32. A film deposition apparatus according to claim 1,

wherein said liquid phase film deposition chamber is provided with a spin coater for forming an EL layer.

33. A film deposition apparatus according to claim 1,

wherein said liquid phase film deposition chamber is provided with a nozzle for forming an EL layer.

34. A film deposition apparatus according to claim 4,

wherein said liquid phase film deposition chamber is a chamber for depositing an EL material.

35. A film deposition apparatus according to claim 4,

wherein said liquid phase film deposition chamber is provided with a spin coater for forming an EL layer.

36. A film deposition apparatus according to claim 4,

wherein said liquid phase film deposition chamber is provided with a nozzle for forming an EL layer.

37. A film deposition apparatus according to claim 7,

wherein said liquid phase film deposition chamber is a chamber for depositing an EL material.

38. A film deposition apparatus according to claim 7,

wherein said liquid phase film deposition chamber is provided with a spin coater for forming an EL layer.

39. A film deposition apparatus according to claim 7,

wherein said liquid phase film deposition chamber is provided with a nozzle for forming an EL layer.

40. A film deposition apparatus according to claim 10,

wherein said liquid phase film deposition chamber is a chamber for depositing an EL material.

41. A film deposition apparatus according to claim 10,

wherein said liquid phase film deposition chamber is provided with a spin coater for forming an EL layer.

42. A film deposition apparatus according to claim 10,

wherein said liquid phase film deposition chamber is provided with a nozzle for forming an EL layer.

43. A film deposition apparatus according to claim 13,

wherein said EL material deposition chamber is provided with a spin coater for forming an EL layer.

44. A film deposition apparatus according to claim 13,

wherein said EL material deposition chamber is provided with a nozzle for forming an EL layer.

45. A film deposition apparatus according to claim 16,

wherein said EL material deposition chamber is provided with a spin coater for forming an EL layer.

46. A film deposition apparatus according to claim 16,

wherein said EL material deposition chamber is provided with a nozzle for forming an EL layer.

47. A film deposition apparatus according to claim 1, wherein said mechanism is provided with a lid.

48. A film deposition apparatus according to claim 4, wherein said mechanism is provided with a lid.

49. A film deposition apparatus according to claim 7, wherein said mechanism is provided with a lid.

50. A film deposition apparatus according to claim 10, wherein said mechanism is provided with a lid.

51. A film deposition apparatus according to claim 13, wherein said cell is provided with a lid.

52. A film deposition apparatus according to claim 16, wherein said cell is provided with a lid.